

## **Sampling Strategies for Determining Volatile Organic Compound Concentrations and Loads at Karst Springs**

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### **Biographical Sketches of Authors**

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### **Abstract**

The influence of different sampling strategies on estimating volatile organic compound (VOC) loads and characterizing VOC concentrations was evaluated at three karst springs in Tennessee. During a six-month period, VOC samples were collected weekly at all three springs and as frequently as every 20 minutes during storms at the two springs with variable water-quality conditions. Total 6-month loads were calculated using the VOC data and the data were systematically subsampled data to simulate several potential sampling strategies.

Results from the study indicate that sampling strategies for karst springs need to be developed on a site-specific basis. The use of fixed sampling intervals (as infrequently as quarterly or semiannually) produced accurate concentration and load estimates at one of the springs; however, additional sampling was needed to detect storm related changes at a second spring located in a similar hydrogeologic setting. High frequency or flow-controlled sampling was needed at the third spring, which had the most variable water-quality conditions. The use of fixed sampling intervals at the third spring significantly affected the accuracy of load calculations and the detection of pulses of high contaminant concentrations that might exceed toxicity levels for aquatic organisms.